Fletcher, Heald & Hildreth, P.L.C.
1300 North 17th Street 11th floor
Arlington VA 22209
703-812-0400 (voice)
703-812-0486 (fax)

MITCHELL LAZARUS
703-812-0440
LAZARUS@FHHLAW.COM

July 29, 2004

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

Re: IB Docket No. 02-10, *Earth Station Vessels*
Ex parte Communication

On behalf of the Fixed Wireless Communications Coalition (FWCC), and pursuant to Section 1.1206(b)(2) of the Commission's Rules, I am electronically filing this notice of an oral *ex parte* communication.

Yesterday Dennis Guill and Dennis Gross of Alcatel, Randy Young of Keller & Heckman LLP, Liliana Ward of this firm, and I, all on behalf of the FWCC, met with James Ball, Lisa Cacciatore, Richard Engelman, Jennifer Gorney, Howard Griboff, Bill Howden, Paul Locke, John Martin, Robert Nelson, and Tom Tycz of the Commission staff to discuss the above-referenced proceeding.

A copy of our presentation outline is attached. The last three pages respond specifically to a calculation on page 2 of a written *ex parte* statement by filed by Broadband Maritime, Inc. on June 2, 2004.

If there are any questions about this filing, please call me at the number above.

Respectfully submitted,

Mitchell Lazarus
Counsel for the Fixed Wireless
Communications Coalition

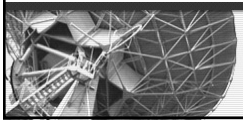
cc: Meeting participants

Earth Station Vessels
IB Docket No. 02-10

Fixed Wireless Communications Coalition

July 28, 2004

Contact: Mitchell Lazarus | 703-812-0440 | lazarus@fhhlaw.com



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Policy Issues

- Parties:
  - ESV proponents seek rules authorizing ESVs in U.S. waters
  - Fixed Service operators seek assurance of protection from ESV interference
- Central issue: which industry will bear the burden of interference?
  - ESVs seek "fair and balanced rules"
  - but a new, potentially interfering service should be required to protect lawful incumbents.

Fixed Service at 6 GHz

- 6 GHz Fixed Service is widely used at port and coastal sites
- Applications include:
  - public safety (*e.g.*, backhauling police and fire dispatch)
  - coordinating railroad trains
  - controlling natural gas and oil pipelines
  - regulating the electric grid
  - backhauling wireless telephone traffic
- Many applications require 99.999% availability
  - some meet 99.9999% (30 sec. or less outage per year).

Do ESVs Interfere with Fixed Service?

- ESV proponents claim the Fixed Service has not documented any case of interference from ESVs
  - hence, they say, ESVs are non-interfering
- Coastal Fixed Service stations *do* experience unexplained outages
  - many are transient, consistent with ESV operation
  - but ESV operators refuse to provide data needed to correlate outrages with ESVs
- ESV claims of "no proven interference" reflect only non-cooperation by ESV operators.

Options to Protect the Fixed Service

- Best: No C-Band ESV operation within 300 km of U.S. shoreline
  - FWCC has no objection to Ku-band ESVs anywhere
- Second best:
  1. coordination;
  2. measures to ensure compliance with coordination;
  3. measures to identify sources of ESV interference, if it occurs; and
  4. measures to minimize widespread ESV proliferation.

Non-Coordinated ESVs Will Interfere

- The Commission proposed non-coordinated ESV operation on a non-interference basis, subject to safeguards
- At best the safeguards help to identify an interfering ESV *only after the interference occurs*
  - this shifts the interference burden to the Fixed Service
  - and is incompatible with ESV operation on a non-interference basis
- ESV operators may have to accept non-optimal conditions in exchange for intruding into a crowded band.

ESV Coordination Is Not Enough

- ESV proponents argue coordination alone will prevent interference
  - but coordination is highly location-sensitive
  - coordination is effective with a terrestrial earth station because stays put
- ESVs have the capability to violate coordinated parameters, *e.g.*,
  - stray from the coordinated route; or
  - enter a route segment where coordination was not possible; or
  - drop below coordinated speed.

Coordination Plus . . . (1)

- Protecting the Fixed Service requires coordination plus these measures:
  - GPS-based automatic shut-off if the vessel leaves coordinated routes
    - ESV proponents resist this proposal
    - but there is no other way to assure compliance with coordination parameters
  - real-time access to ESV itinerary and frequencies
    - can be through a trusted third party
  - 24/7 ESV contact capable of remote shut-down
  - periodic renewal of frequency coordination
  - two-year license term.

Coordination Plus . . . (2)

- Coordinating ESV routes eliminates many potential Fixed Service sites
- To control ESV proliferation:
  - limit coordination to
    - needed frequencies (not to exceed 36 MHz in each direction on each of two satellites)
    - azimuths and elevations for those satellites
  - limit ESVs to 5,000 gross tons (deep draft vessels)
    - intention is to cover all cruise ships
    - FCC proposal of 300 gross tons includes small inland vessels -- even small ferryboats
- Apply long- and short-term interference criteria.

Past ESV Investment is Irrelevant

- ESV operators ask the FCC to take into account their "huge investment" in C-band equipment
- But ESV operators knowingly made those investments with no assurance of future operation
  - ESV STAs state: **"Any actions taken as a result of this Special Temporary Authority are solely at [the grantee's] own risk."**
- Possible ESV gambit: (1) promise non-interference to obtain an STA; (2) invest heavily; (3) justify a long-term interfering authorization by citing the investment.
- The Fixed Service should not suffer interference just so ESV managers can look good to investors.

Conclusions

- ❑ As an incoming technology, ESVs should be required to protect the Fixed Service from interference.
- ❑ Coordination is necessary but not sufficient for a moving interference source.
- ❑ ESVs should be required to shut off automatically when away from coordinated routes.
- ❑ Fixed service operators (or a trusted third party) need access to ESV itinerary and frequencies
- ❑ ESVs should be limited to needed frequencies and to vessels of 5,000 gross tons.
- ⌘ Nothing less will protect vitally needed Fixed Service operations.

Thank you!

Fixed Wireless Communications Coalition
Mitchell Lazarus
703-812-0440
lazarus@fhhlaw.com
www.fhhlaw.com

Earth Station (E.S.) to Terrestrial Fixed Station (F.S.) Interference Calculation

EXAMPLE 1 uses an uplink power density of -7 dBW/4 kHz for a typical ESV and the -154 dBW/4 kHz interference objective for an earth station into terrestrial station:

Power E.S.	=	- 7.0 dBW/4 kHz (Earth Station parameters from actual PCN)
E.S. Gain	=	+ 7.0 dBi (max toward horizon @ 9.9° minimum elevation angle)
Free Sp. Loss	=	-132.4 dB (10 miles)
F.S. Ant. Gain	=	+ 41.0 dBi (8' dish, main beam, no discrimination)
F.S. Line Loss	=	- 2.4 dB (200' waveguide @ 1.2 dB/100')

Interference = -7.0 dBW/4 kHz + (antenna gains - FSL - line loss)
Interference = - 7.0 dBW/4 kHz - 87 dB (rounded) = - 94 dBW/4 kHz

Interference case margin = -154 dBW/4 kHz -94 dBW/4 kHz = -60 dB
i.e., the ESV interference level misses the -154 dBW/4 kHz objective by 60 dB into the terrestrial receiver.

EXAMPLE 2 uses the terrestrial T/I objective of 34 dB. Using the -7dBW/4 kHz as above, the earth station interference power into the terrestrial receiver is derived as follows:

-7 dBW/4 kHz = +23 dBm/4 kHz by applying +30 dB conversion factor for dBW to dBm

+23 dBm/4 kHz + 10 log*(3000/4)kHz (total power in the 3 MHz ESV uplink signal)
+23 dBm/4 kHz + 29 dB = +52 dBm total power in the 3 MHz signal

Interference = +52 dBm - 87 dB (same system gains-losses as above)
Interference = -35 dBm

Comparing this interference signal to a T/I objective of 34 dB for a 30 MHz digital receiver with a threshold of -70 dBm would give the following result:

Victim receiver interference objective = -70 dBm (threshold) -34 dB (T/I objective)
Interference objective : -104 dBm:

Interfering level is -35 dBm (from above example)
Interference case margin is -104 dBm - (-35 dBm) = -69 dB
i.e., the interference level misses the -104 dBm objective by 69 dB.

Earth Station (E.S.) to Terrestrial Fixed Station (F.S.) Interference Calculation
(cont.)

The software used by the coordinating industry uses the -154 dBW/4 kHz interference objective and not the T/I objective of the terrestrial receiver. In this instance, the case margin would be understated by 9 dB using the current coordination procedure.

Undocumented "safety" factors that can reduce interference from land-based earth stations might include the following:

1) Close-in shielding,
2) Earth station antenna pattern better than FCC standard,
3) Operating power less than coordinated power, and
4) Uplink frequency not operating co-channel with terrestrial station.

INTERFERENCE PATHS